Ethanol Trade Development as Part of APEC’s Renewable Strategy

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The U.S. Grains Council develops export markets for U.S. barley, corn, sorghum and related products including distiller’s dried grains with solubles (DDGS) and ethanol. With full-time presence in 13 key markets and representatives in an additional 15 locations, the Council operates programs in more than 50 economies and the European Union. The Council believes exports are vital to global economic development and to U.S. agriculture’s profitability.
Four factors will continue to drive the use of ethanol and the development of new or expanded ethanol policies globally.

<table>
<thead>
<tr>
<th>Factors initially driving global ethanol policies</th>
<th>Factors now: similar, more focus on GHG and economics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedstock/agricultural producers</td>
<td>Feedstocks are a major (75%) component of production, and overall labor and GDP contribution</td>
</tr>
<tr>
<td>Complementary industries</td>
<td>Storage infrastructure, transportation networks, initial plant installation, R&amp;D, → rural jobs</td>
</tr>
<tr>
<td>Environmental and human health benefits</td>
<td>Improving air quality and addressing other environmental concerns</td>
</tr>
<tr>
<td>Consumers and profitability</td>
<td>Cost benefits to consumers</td>
</tr>
</tbody>
</table>
More than 60 economies have ethanol policies, global production has surpassed 100 billion liters

APEC growth potential

- China – nationwide E10
  - 2020, 18 billion liters
  - +14 billion liters
- United States – E10+
- New and expanding policies
  - Canada, Mexico, China, Vietnam, Indonesia, Russia(?)
- Replacing oxygenates?
  - Chinese Taipei, Chile, South Korea, Mexico
- Supported by trade

Top 15 Largest Gasoline Markets
(excluding United States, 545 billion liters and China, 190 billion liters – in 2018)

Note: * Includes Gasoline C (which included anhydrous) plus hydrous.
Source: Int'l Energy Agency (IEA), Paris; 2017 Projections thru 2022 based on Brent $61.5/bbl by 2022; extended to 2026 by OECD biofuels staff.
2017 Global ethanol trade reaches 8.3 billion liters
U.S. share of world exports expands to 65%

Source: Global Agricultural Trade System (UN Trade Data subset) and Global Trade Atlas, U.S. Grains Council – projections (p)
In global trade, major producers and exporters are also importers – policy with a role for trade is critical.

**Major exporters – economies with sufficient feedstock**
- United States – 5.2 bln liters
  - Brazil, Canada, India, Philippines, South Korea
- Brazil – 1.4 bln liters
  - U.S., South Korea, Japan, EU
- Pakistan – 450 mln liters
  - Japan, South Korea, EU, Taiwan
- India – 140 mln liters

**Major importers – policies with a role for trade**
- Brazil
- Canada
- United States
- Japan
- Philippines
- India
EWG12-2015A
Ethanol Trade Development as Part of APEC's Renewable Fuel Strategy

Roadmap for best practices in developing an ethanol policy – benefits and policy tools

- Reduced GHG emissions, improved air quality, economic advantages
- Mandates, incentives & compliance, administration, role for trade

Case studies for member economy experiences in developing domestic ethanol sectors

- Canada, Peru, Philippines, Thailand, United States
Industry innovation – co-products key to profitability and GHG reductions

### Co-products, on average per bushel of corn

<table>
<thead>
<tr>
<th>Co-product</th>
<th>End use</th>
<th>GHG Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>Fuel and industrial applications</td>
<td>7.5 kilograms</td>
</tr>
<tr>
<td>10.9 liters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distillers dried grains</td>
<td>Feed</td>
<td>7.4 kilograms</td>
</tr>
<tr>
<td>7.4 kilograms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn oil</td>
<td>Feed, biodiesel, and industrial applications</td>
<td>0.34 kilograms</td>
</tr>
<tr>
<td>0.34 kilograms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO₂</td>
<td>Beverages, dry ice, and industrial applications</td>
<td>7.5 kilograms</td>
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<tr>
<td>7.5 kilograms</td>
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</table>

Source: Renewable Fuels Association

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**Co-products and GHG emissions reductions**

According to USDA, U.S. corn ethanol reduces emissions by 43% over conventional gasoline, expected to exceed 50% by 2022. Many individual plants exceed 55% GHG reductions.
Oxygenation requirements, phase out of MTBE, and value of octane boost demand for ethanol in the U.S. and globally.

Blending octane ratings of various gasoline components

Regular-grade gasoline (87)

Source: U.S. Department of Energy and ethanol industry
Ethanol is cheapest source of octane over the last decade, holding significant economic advantages.
**APEC roadmap used in market development efforts globally**

<table>
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<th>EWG 12-2015A project timeline and next steps</th>
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<tr>
<td>- April 2016 – First workshop held in Taichung City, Chinese Taipei, 14 economies participated</td>
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<tr>
<td>- March 2017 – Presented roadmap and case studies to APEC member economies and received approval to publish</td>
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<tr>
<td>- May 2017 – EWG Meeting in Jeju, Korea</td>
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<tr>
<td>- October 2017 – Ethanol Summit of the Americas – Dr. Chern, Lead Shepard for EWG, presents the roadmap to 15 economies in the Western Hemisphere in Houston, Texas</td>
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<tr>
<td>- March 2018 – Project update at EGNRET 50</td>
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<td>- May 2018 – Ethanol Summit of the Asia-Pacific, held in Minneapolis, Minnesota</td>
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<tr>
<td>- July 2018 – Energy access workshop in Jakarta, Indonesia</td>
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<td>- 2019 – EWG Ministerial in Chile</td>
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</table>
Our goal is to develop global biofuels alliances

The U.S. ethanol industry is working with interested economies to avoid false starts in policy development and to share best practices in expanding the global use of ethanol

- **Focus on working with industry and government** to develop proven policy supports, including enforced blending mandates and/or tax incentives
- **Highlight benefits to society** that result from biofuels blending – GHG emissions reductions, improved air quality, and economic advantages throughout the entire value chain
- **The critical role of trade** that guarantees consistent supply as the domestic industry is developed or in an unfavorable feedstock environment
- **Support offered** through bilateral working groups, trade missions, reverse trade missions, technical and policy workshops, and a global alliance
Interested to learn more about building global biofuels alliances:

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